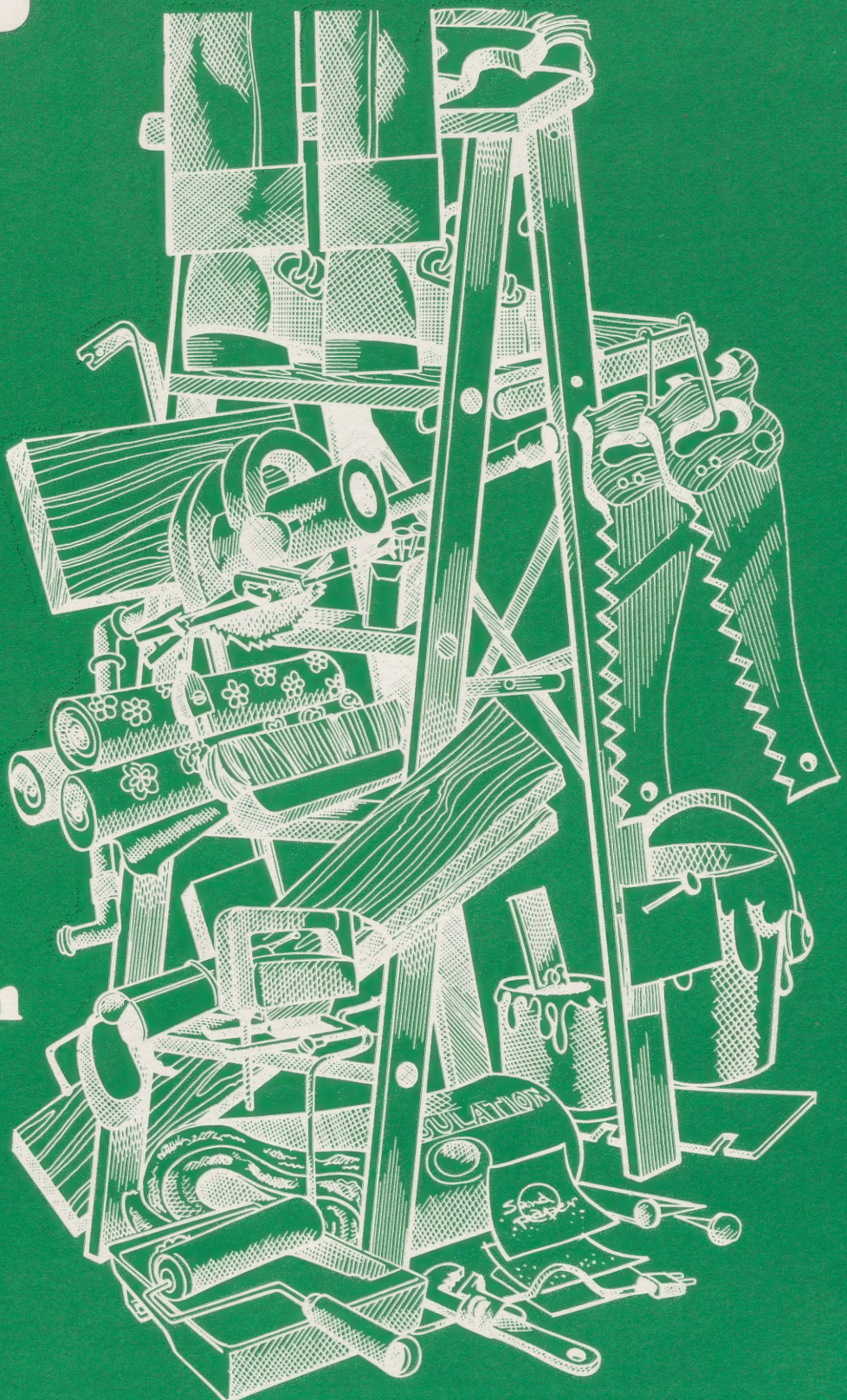
IBS

the journal of college radio

Jan./Feb., 1980 Vol. 17, No. 4



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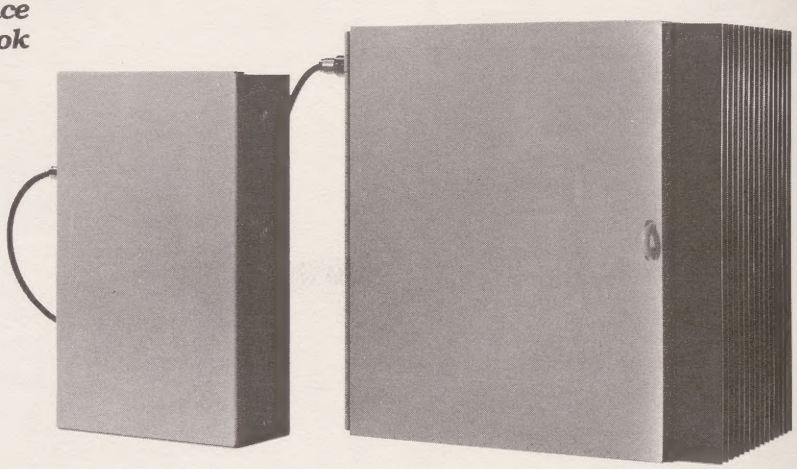

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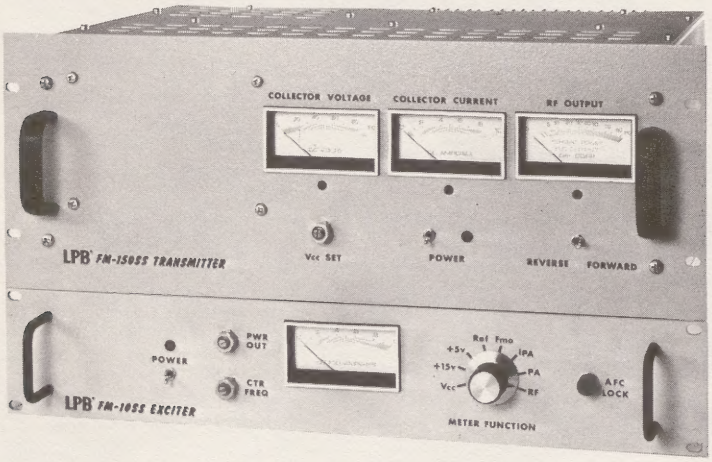

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Editor
JEFF TELLIS

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in this issue:

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from the editor

In its infinite and sometimes unfathomable wisdom, the FCC has approved a reorganization of its Broadcast Bureau which abolishes the Educational Broadcasting Branch.

This is the office which has provided the most help of any within the Commission to school and college radio stations. They have understood our problems, they have come to our conventions and talked with many of us directly, and they have tried to provide the special kind of information and assistance our stations need.

To do this, they cut across a lot of bureaucratic lines. Unlike other FCC offices, they would get you information and answers from every specialized area. Others, though willing to help, could do so only within the limited territory covered by their office. Anything beyond that, and you were shuffled over to another office, and maybe to another, and another, etc.

But, the Educational Broadcasting Branch was an office with people who understood. They knew the non-commercial educational FM broadcast rules and what made them different from those for commercial stations. They knew the unique kinds of stations we have and how they operate.

If you needed an FCC form, or a copy of a docket or a reference to a particular section of the rules, or help on procedure . . . they were there. And, if they couldn't give you an instant answer, they would research it and call you back. They would not pass you around from office to office.

In the last year or so, the office was staffed by two people: Dr. Robert Hilliard (Branch Chief) and Allen Myers (Broadcast Analyst). Both were familiar to college radio people who've attended the IBS National Conventions in recent years. They've conducted workshops and seminars, open-question forums, and coordinated and moderated FCC panel sessions. For many, they were the first real people from the FCC who seemed to take an interest in their stations and in their problems.

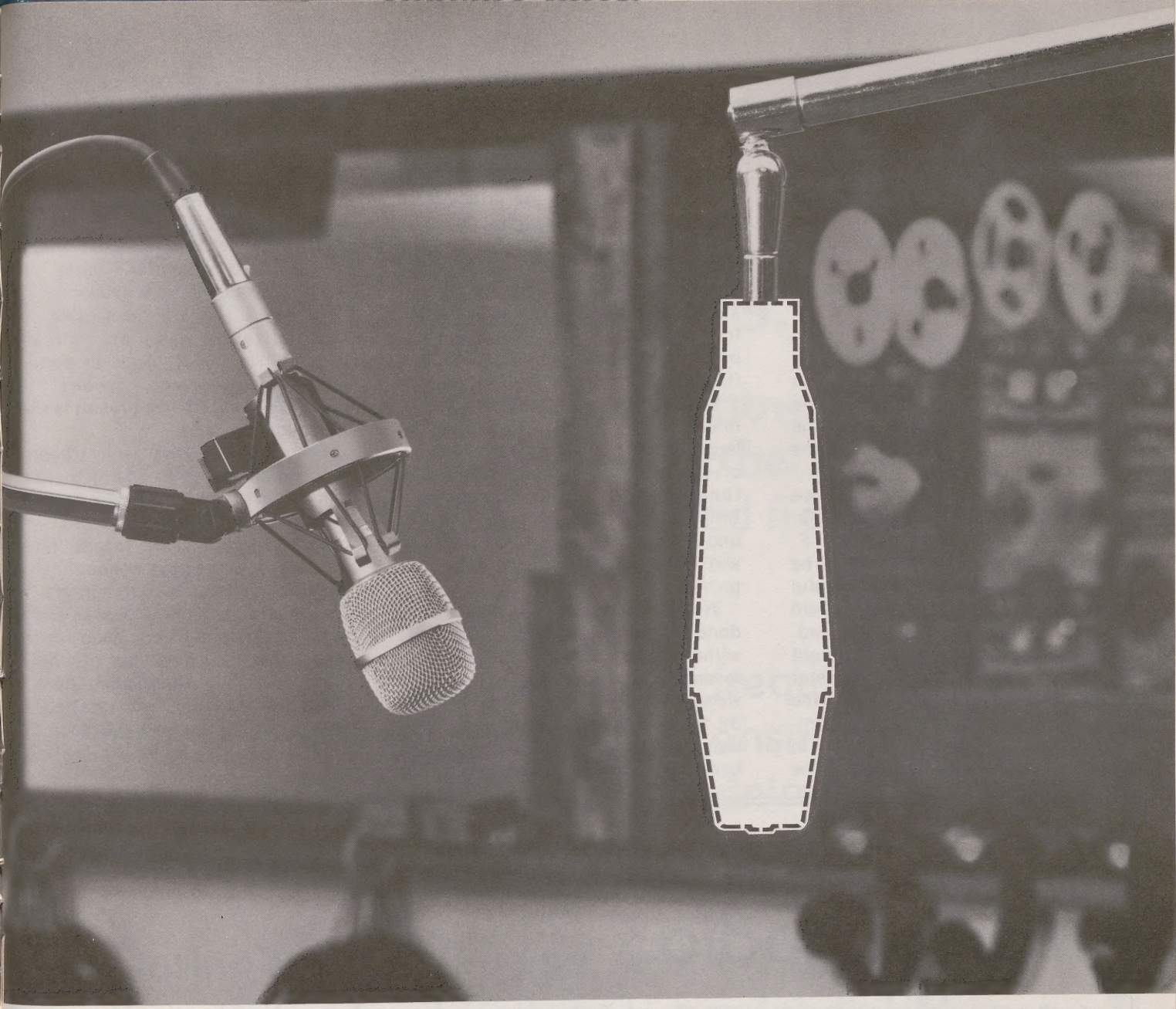
With the Educational Broadcasting Branch being abolished, we understand that Allen Myers is being reassigned to processing commercial AM station applications. Dr. Hilliard is to join the Policy and Rules Division, presumably as an educational broadcasting specialist, but the details of his new role are as yet unannounced.

The responsibilities and functions of the Educational Broadcasting Branch are to be shifted to the Policy and Rules Division. The question may be how many of those responsibilities and functions survive the move, and what level of service will be provided to our stations.

Broadcast Bureau Chief Richard Shiben said the changes would result in improved service. We find it hard to understand how eliminating half of an already small staff and diminishing the role of the other half will result in improved service.

In fact, IBS has filed a Petition for Reconsideration on this matter, in the form of a letter to the Chairman with copies to each Commissioner and to the Secretary. Similar letters were sent to members of the House and Senate subcommittees having jurisdiction in this area. At this writing, there's been no official response to the petition from the FCC.

Commissioner Anne P. Jones did write us a brief note expressing gratitude that we had communicated our concern. She went on to say it was her understanding that "the action taken in no way reflects a desire of the Commission to deemphasize educational broadcasting, but rather was intended to streamline the function and make it more efficient. Let me assure you that all of us on the Commission have a strong com-



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mitment to educational broadcasting."

We have no reason to doubt that Commissioner Jones believes that. In fact, we believe the majority of the Commissioners voted to approve this reorganization for the same reasons, and because it was considered an internal "housekeeping" matter. However, our views are more in agreement with those of Commissioner Quello, who issued a dissenting statement, joined by Commissioner Washburn. They too questioned the "less is more" premise and expressed reservations about the practical results, regardless of the stated noble intentions.

The only other responses we received were from Senator Mark O. Hatfield, and Senator Thomas F. Eagleton. Senator Hatfield said he would ask FCC officials for a "careful review of this situation" and would write us as soon as they responded. Senator Eagleton said he had brought the matter to the attention of Senator Ernest Hollings, Chairman of the Senate Subcommittee on Communications and would be back in touch when he had a reply. The Hatfield and Eagleton letters were sent in early December.

Meanwhile, the weeks have passed, and the reorganization has been implemented. In an apparent effort to counteract some of the criticism, a new task force has been formed to try to help speed-up the processing of the flood of power increase and frequency change applications filed by 10-watt stations. Estimates have been ranging from nine to 11 months to get approval, and they'll be trying to get that figure down by two or three months.

But, regardless of the success or failure of this one-issue task force, the larger questions remain on how many of the previous responsibilities and functions of the Educational Broadcasting Branch will survive under the Policy and Rules Division, and what will be the level of service provided.

We are not happy with what's been done nor the way in which it was done, without a reasonable opportunity for a meaningful expression of opposing views from the very stations affected by these changes, before a decision was made. All of our expressions have been in the form of reactions to an already-announced decision, putting us at a severe disadvantage procedurally. It's much more difficult to reverse a decision which has already been announced than to have some meaningful input and effect before that decision has been made. But, because this was an internal reorganization matter, that opportunity was not made available.

So . . . it looks like the reorganization is an already-accomplished fact. And, in spite of any window-dressing "reviews" that may take place, the end-result is likely to remain the same.

Even if we haven't always been in total agreement with them, there are some capable and intelligent people in the Policy and Rules Division who have, particularly in recent times, become involved with noncommercial educational broadcasting matters. We can only hope, as time passes and we gain experience with each other's areas, that the same kind of working rapport can be established here as existed with those who staffed the Educational Broadcasting Branch.

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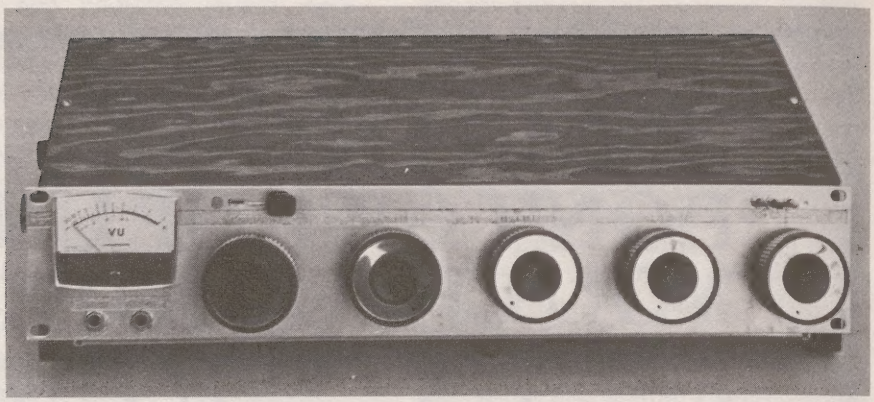


By Ronald Pesha

You can build a complete control board, achieve excellent sound quality and good appearance, and save money. Modern ICs have made the job enormously simpler than in the days of vacuum tubes or even the days of discrete transistors. I know; I have built boards since the days of tubes.

My early attempts were embarrassing disasters, but then I had no instructions. The suggestions in this article should get you started, and keep you going without too many pitfalls. Study the basic design, then modify it to meet the unique needs of your own station.

During seventeen years in commercial broadcasting I built numerous control boards, including two full-size stereo boards for a high power FM station. I also deejayed at stations ranging from the very small to a leading station in the nation's second market, so I know how a board should "feel." This is important; if you are not an announcer, get input from those who are. I am now broadcast instructor at a small college, and our ten-watter uses two boards of the design suggested in this article.

Basic Design

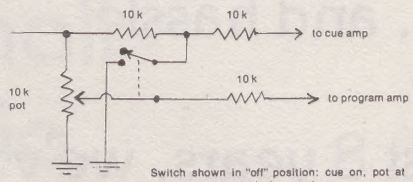
Basically a control board consists of a large number of inputs, each with a pot, mixed together on a common wire called a "mixing buss" and feeding a program amplifier. Refer to the Overall Schematic, (Figure 1) which shows one microphone input, one turntable input and one "high level" input. Preamplifiers for microphone are built into the control board, but turntable or phono preamplifiers are external. The "high level" inputs require no preamplification; these inputs are used for various types of tape players, telephone lines, etc.

All pots except the microphone pots are provided with cue positions. When in cue, the input is switched to feed a cue amplifier via a common "cue buss." (Figure 2). As a cue amplifier need be neither high power nor high fidelity, a small amplifier is built into the control board. Its output feeds a small speaker which can be mounted externally.

The main microphone switch shorts the microphone preamp output when off, and shorts the audio to the monitor amplifier when on. This mutes the monitor. Additional contacts can control a warning light.

It is easy to fabricate a very small "remote" amplifier by simply providing a few microphone preamplifiers feeding pots which mix via a mixing buss and feed a program amplifier. Such an amplifier may be built in a very small case, provided with a suitable headphone output, and powered with flashlight cells. The LM386 IC amplifier which is suggested for use in a large control board is ideally suited for this application, as it will function fine on six volts (four flashlight cells). Six volts will not allow sufficient output to drive a speaker for a cue amplifier, but is adequate for program-level output (a few milliwatts) in a remote amplifier.

Using a Conventional Pot Switch as a Cue Switch



Switch shown in "off" position: cue on, pot at extreme counterclockwise rotation.

Figure 2

Overall Schematic

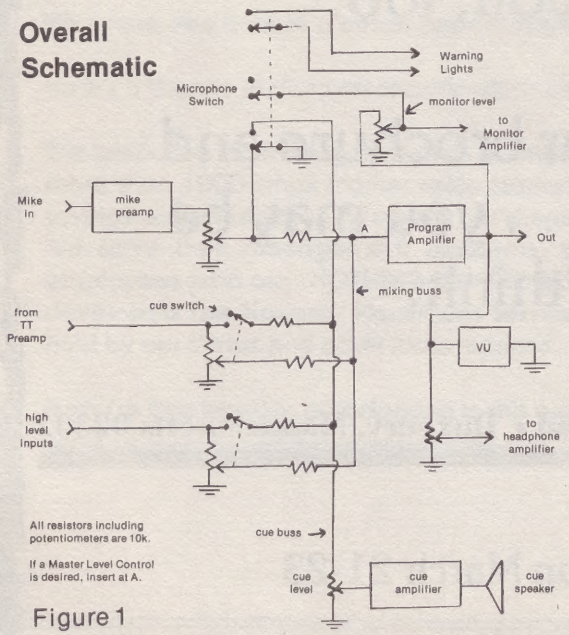
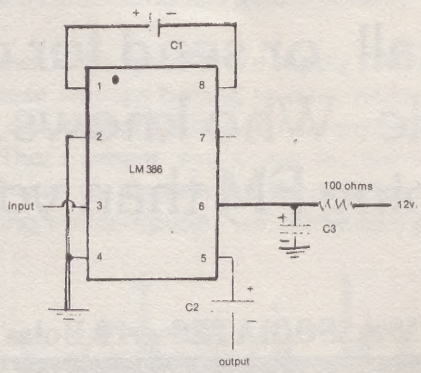


Figure 1

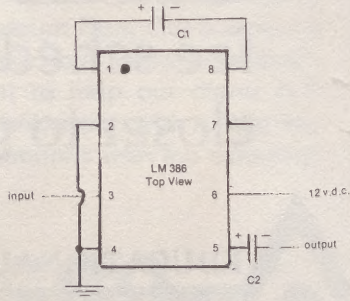
Microphone Preamplifier



C1 10 uF 10 V or better
C2 10 uF 15 V or better
C3 10 uF 25 V or better.

Figure 3

Cue Amplifier
Headphone Amplifier
Program Amplifier
Monitor Amplifier



C1 10 uF 10 V This capacitor is optional and is used only if additional gain is needed. If gain of 20 (26 db) is sufficient, pins 1 and 8 should be left open.

C2 For program amplifier, 100 uF 15 V or better. For cue, headphone, or monitor amplifier, 500 uF 15 V or better (more capacitance increases bass).

Figure 4

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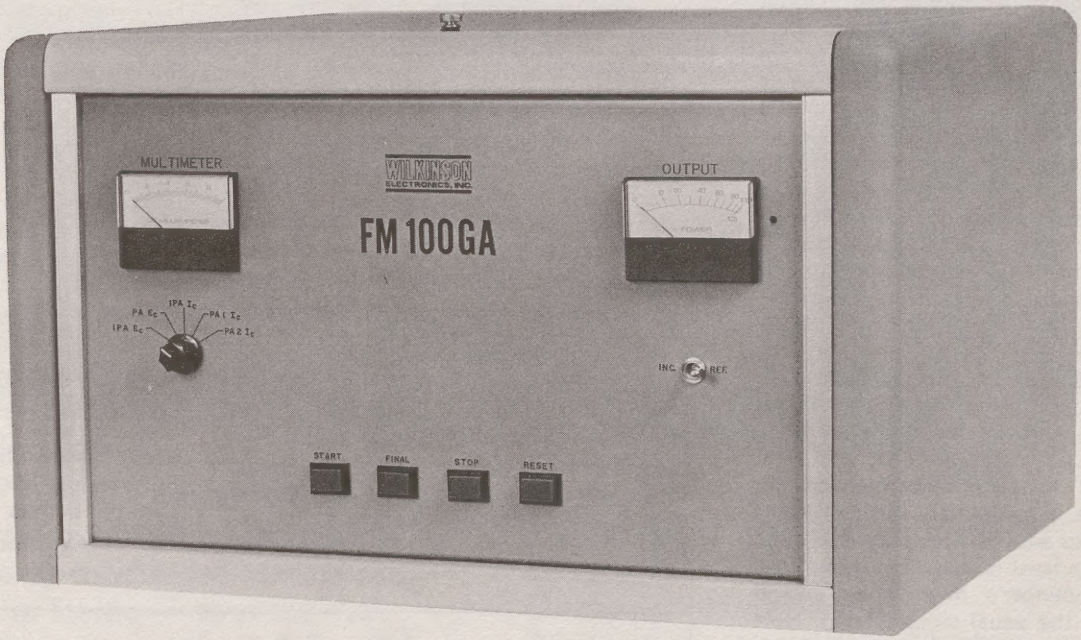

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The Amplifiers

While this control board may be built with opamp type ICs for superior performance, I recommend using the LM386 (Figures 3 and 4). It's cheap, versatile, simple, and readily available at Radio Shack stores (no, I have no connection with Radio Shack). In the control board in the photographs, the 386 is used for microphone preamplifier, program amplifier, cue amplifier, headphone amplifier, and even low power monitor amplifier purposes. Using a single-ended 12-volt power supply, this IC needs a minimum of parts and provides sufficient output to drive 8-ohm speakers and headphones directly.

This low-impedance output is also used to drive "500 ohm" program lines. Now the subject of "impedance matching" is often misunderstood, and a full discussion would require much space. In this instance we are using the contemporary approach of feeding relatively high impedance loads with a low impedance source. The 500 ohm program line is effectively merely "bridging" the IC output, at such a higher impedance that its characteristics have no significant effect on the IC output.

Transformers often fail to function properly if the impedances are not closely matched, but we use no transformers here. For short runs, they aren't necessary. If the control board feeds nearby tape recorders, etc., just use single conductor shielded cable. If you do have a long audio run, such as to a carrier-current transmitter in another building, you will need a transformer. In this case, you can use a 500 ohm to 8 ohm transformer with the 8 ohm side wired across the control board's output.

The 386 is also recommended for microphone preamplifier service. While not designed as a low level device, I find that its hiss level is inaudible when used as an announcer's microphone preamplifier with the usual close talking. Note that the high input impedance of the 386 is bridged across the microphone's output, with no transformer. Again, if you have no microphone runs over 30 or 40 feet, you will probably experience no difficulty in using single conductor shielded microphone cable. The 386 wired in this manner can handle microphones from a very low impedance up to at least 10,000 ohms impedance.

I find that the overall distortion of the control board at program-level output (the milliwatt range) is well under 0.5%.

Using Opamp Amplifiers

If you prefer to use conventional opamps, I am including suggested amplifier designs (Figures 5 and 6) using a type 301 or 748 IC. Again, the very high impedance input merely bridges a microphone output and uses no input transformer. The output impedance of this type of amplifier is considerably higher than the output impedance of the 386, but it can also feed a program line directly without use of a transformer. If a transformer is necessary, for feeding a long audio line, use a 1:1 ratio transformer, rated at 500 to 500 ohms or 600 to 600 ohms.

An opamp requires a dual power supply, often called a split or center tapped power supply. I have found regulated power supplies unnecessary for this application, although it is often necessary to connect a large value non-electrolytic capacitor to ground from the + and — terminals of each IC. .05 uf or 0.1 uf capacitors are suggested.

Suggested amplifier designs include a necessary bypass capacitor, which should be as small in value as possible without resulting in oscillation or instability. Typical values range from about 4.7 pf to about 30 pf.

The Etched Circuit Board

The major hobbyist-type electronics parts dealers sell etched-circuit or printed-circuit boards which match DIP ICs such as the 386 and the 301/748 opamp. These boards include copper pads for mounting components. As each amplifier is so simple, with so few components, this approach is far easier than etching your own boards.

I mount the components on the same side of the board with the etched copper "wiring." This allows me to mount the board flat in the bottom of the case rather than on edge, and it makes for easy circuit tracing. I drill holes through the copper pads at ground points so that the 4-36 or 4-40 size machine screws used to secure the etched circuit boards in place also make the ground connections. I include internal tooth lockwashers under the nuts to be **sure** of a solid ground. Obscure problems have been traced to high-resistance grounds. In one case, an apparently tight and secure nut was loosened to reveal corrosion beneath. Once this bad ground was eliminated, the equipment functioned properly.

The Mixing Pots

If you're building a board, you're probably doing it to save money. Expensive constant impedance attenuators are out, unless a commercial station has given you an ancient vacuum-tube board with tar leaking from transformers but good pots. I salvaged pots from such a board and junked the rest (the case could have been stripped and repainted, but it was just too large). At other times I have used ordinary carbon pots, even when building boards for small commercial stations. True, they wear out rapidly. But they are cheap to replace and, if the board has been fabricated in an accessible manner, easy to replace.

By using inexpensive carbon pots, you can select a convenient mixing resistance. I suggest 10,000 ohm pots. This value is high enough not to "load" most sources to excess, but low enough to keep noise pickup low. You may locate the higher quality Ohmite "AB" brand pots at a bargain price on the surplus market. If only linear-taper pots are available, they can be converted to audio taper by connecting a resistor from wiper to ground. This resistor should be about 15 to 20 per cent of the resistance of the pot.

Pot Spacing and Knob Size

By all means, space the pots widely and use large knobs. Disc jockeys cannot work easily with tiny, close-spaced knobs. Furthermore, excessively small and narrow control boards with tiny knobs look

(Continued on Page 16)

Use of IC Opamp Type 301 or 748

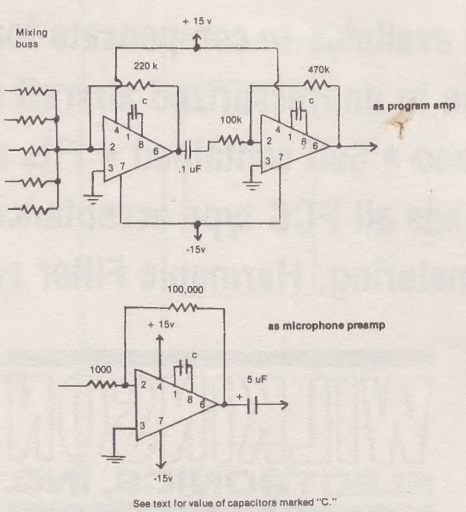

Figure 5

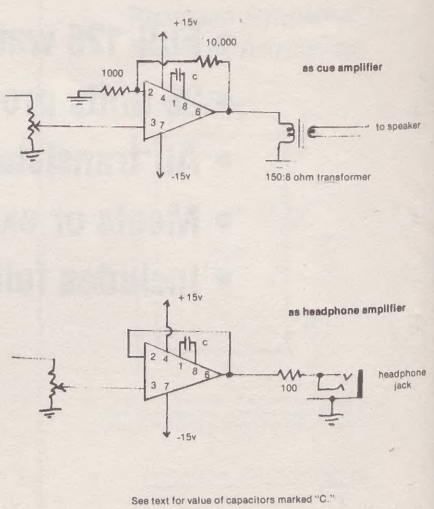

Figure 6

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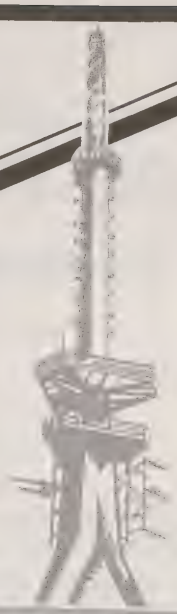

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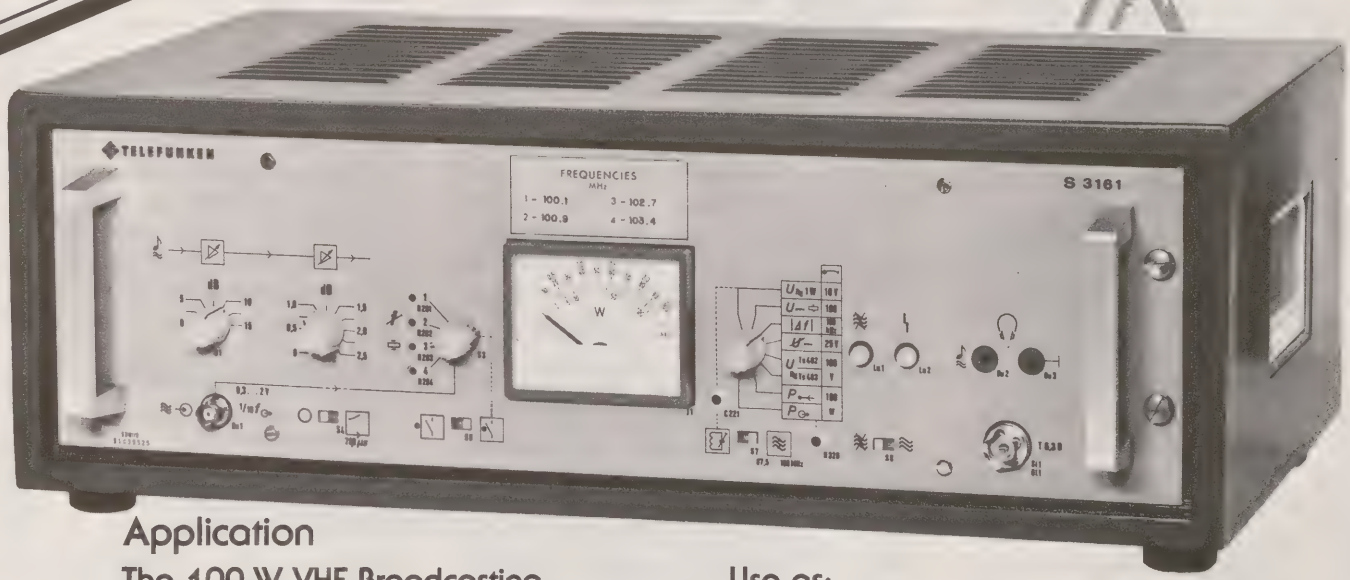

Application

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more on alternatives to an ED-FM table of assignments

by Jeffrey Close

Editor's Note: This article picks-up a discussion started in the September issue of JCR, repeats some of the main points, but elaborates more on the proposed use of computers in resolving spectrum allocation problems. Although the author is employed by the National Telecommunications and Information Administration [NTIA], the opinions expressed here are those of the author, and not necessarily those of NTIA.

INTRODUCTION

In the past decade, the frequency band alloted to the Non-commercial Educational FM Service (88.1 to 91.9 MHz) has become crowded. Educational FM has never had a Table of Assignments since its inception, but the Corporation for Public Broadcasting feels that such a table is needed to solve spectrum scarcity problems in this band. TV and Commercial FM both have Tables of Assignments. But both of these services were given tables while the services were young. The table provided for the orderly and optimum (hopefully) expansion of these services. In contrast, the AM band has never had a Table of Assignments and the expansion of the AM service has been far less organized than TV or commercial FM.

It is questionable whether a Table of Assignments can be retro-fitted to the Educational FM Service. The Corporation for Public Broadcasting (CPB) claims that the Table is needed to provide hundreds of new stations. The problem with the CPB scheme is that it causes damage, even needless damage, to smaller stations (particularly 10-watt Class D stations) and is oriented to the needs of CPB rather than all educational FM stations.

It is the intent of this article to look at the spectrum issues in the Educational FM band and to present additional and alternative solutions to the CPB Table of Allocations as it is presented in FCC Docket 20735.

HISTORY

Educational radio has not grown along with the American radio system in general. Many educational stations were started in the 1920s in the AM band. No special provisions were made for these stations. They had to compete on an equal basis with the commercial stations. Of those stations that managed to survive fierce competition in the middle 1920s, few survived the Depression (less than a dozen). Movements to make special allocations for educational stations met with failure until after WWII. A special allocation amendment to the Communications Act of 1934 was never passed. In the following year, the Commission itself reiterated that there would be no special treatment of educational radio in the AM band. After WWII, educators and other interested parties worked hard to see that a portion of the new FM band would be specifically set aside for Educational Radio.

The new FM band had many problems. Prior to WWII, FM radio had been assigned temporarily to the 42 MHz area. The FM radio service naturally developed slowly due to the war. At the end of the war the FCC took up the issue of FM radio and assigned it to a much higher band of frequencies. This made about 500,000 receivers worthless and greatly set back the development of FM radio due to the additional problems of the higher frequency band. At that time FM radio was seen as competition and it appears that the parties interested in television were responsible for dealing this setback to FM. [1]

To encourage colleges and universities to make use of this band (Educational FM), in the late 1940s the Commission permitted a station to go on the air with only 10 watts of power instead of the previous minimum level of 100 watts. This new class of stations was called Class D. Ten watts is usually sufficient to cover any college campus and the lower cost was important to educational institutions as many of them were only looking to set up training facilities for future broadcasters. [2]

Despite the new Class D, FM radio in general went downhill during the early 1950s. Because of this, the Commission put aside its plan to assign specific frequencies to specific communities and basically accepted any reasonable application that would get a station on the air. Meanwhile, the Commission took other steps to encourage FM radio in the commercial FM band. In 1955 the Commission approved the usage of Subsidiary Communications Authorizations (SCA). This permitted the broadcaster to lease an unused portion of his designated bandwidth to specialized users, such as background music to grocery stores. By 1957 the decline in the number of FM stations turned around and FM began to grow. With the advent of stereo FM in 1961, the number of FM receivers and stations increased. Prior to 1960, all of the stations in the Educational FM Band had been created by educational institutions. In 1960 the Commission permitted community groups to apply for licenses. This brought about the listener-sponsored stations that later formed the NFCB (in 1975).

The upward trend in FM radio led the Commission to a Table of Assignments for the commercial portion of the FM band, but not for the non-commercial portion. A good description of this event is given in the following paragraph from the report of the Second Carnegie Commission:

> *But in the early 1960s, the commercial portion of the FM band had begun to fill up and operators were asking for more efficient allocation policies. In 1962, the FCC complied, providing a table of allocations for commercial FM stations throughout the country. They declined to do the same for the 20*

reserved non-commercial FM channels, a circumstance which the FCC has yet to remedy. Part of the reason for this inaction during the 1960s was that the FCC saw no way to determine where educational stations should be placed so that all Americans would receive FM service. Prior to the adoption of the goal of full service public broadcasting in 1967, most educational radio stations offered services that catered to rather narrow interests. Licenses, it was assumed, would be held by universities and special interest community groups, whose location was not clearly related to the size of their potential audience or full national coverage.[3]

The Commission has continued to the present in assigning new Educational FM stations on a space available basis. In the 1960s many new stations began operating in this band and by the end of the decade there were 400, roughly, in all. In the mid-60s, the Carnegie Corporation undertook its first study of the educational broadcast media which eventually led to NPR. In 1967, as the Carnegie report brought attention to the educational FM arena, the FCC stated that it was considering putting a freeze on any new applications for Class D stations. However, the Commission did not put the freeze into effect. Also in this year, Gates Radio (now Harris Corp.) introduced a solid state 10-watt transmitter which made Class D stations very easy to run technically.

As more stations came into this band, the newly formed NPR looked for ways to fulfill its goals of national service. Therefore, in May of 1972 CPB petitioned the Commission for a series of rulemaking changes that they felt would improve the quality of educational non-commercial radio. The Commission decided to form Docket 20735 in March of 1976, and issued a Notice of Proposed Rulemaking concerning CPB's petition which was nearly four years old at that time. The slowness of the Commission is not likely due to political sensitivity of this area, as it has little. Nor was it likely due to a great number of negative responses to the original petition as only three of the 42 responses were negative. The Commission's lack of speed is perhaps more a mark of the low priority given to the Educational FM Service.

After two more years the Commission issued a series of actions with respect to educational, non-commercial radio:

First Report and Order	15 June 1978
Second Report & Order	6 Sept 1978
Further Notice of Inquiry	7 June 1978
Memorandum Opinion and Order	12 January 1979

These various actions have caused changes in the policies concerning the operating hours of all educational stations as well as massive changes for the Class D stations. Concurrent with all these changes has been the second investigation of the Carnegie Corporation. The basic information gathering of the Carnegie study was done from October of 1977 to June of 1978. This second Carnegie Commission published its final report in April of this year in the form of a book entitled "A Public Trust." It is likely

that the Commission has relied heavily on the work of the Carnegie Commission (II) in adopting changes for the FM Educational Radio Service. Unfortunately, the Carnegie Commission was only concerned with expanding NPR.

The recent changes to all EDFM stations and 10-watters in particular have been amply covered in recent issues of the **Journal of College Radio.** The action that is now pending before the FCC is CPB's proposed Table of Assignments. Discussions of the table itself and problems with it have also appeared in recent issues of JCR.

There are alternatives to CPB's Table of Assignments. A first look at these alternatives was given in the September issue of JCR. A further, more detailed look, follows.

ALTERNATIVES

In its Notice of Proposed Rulemaking, the FCC states in paragraph #3:

> *Originally, we expressed our belief that it was unlikely that a nationwide Table of Assignments could be developed for the FM Channels. . ., we had serious questions about our being able to decide where the need was for the assignments.*[4]

In light of the IBS comments, it appears that the Commission's statement above is correct. Assignment Tables can be of use to the orderly growth of a new broadcast service, but retro-fitting one to a mature service has not been tried. (For example, AM radio has never had such a table retro-fitted). However, any plan for the use of the non-commercial FM band must look to the maintenance of local service and the expansion of regional service as envisioned by CPB.

In addition to the CPB plan for nine classes of FM stations, the National Telecommunications & Information Administration (NTIA) has presented further methods of handling the spectrum problem in commercial section of the FM band that apply equally well to the non-commercial section of the band.[5]

One of the NTIA proposals is the extensive use of FM directional antennas:

> *Directional antennas are an effective and widely used tool for promoting the efficient use of the radio spectrum. . . .In contrast to omnidirectional antennas, directional antennas allow transmitted signals to be concentrated in certain directions and supressed in others. . . .They can also be used to reduce the signal strength in a given direction so that interference to a distant station can be reduced or eliminated. By careful siting of the transmitter both objectives can often be achieved simultaneously.*[6]

Although the Commission presently permits FM directional usage in special cases, it is not permitted to bypass the mileage separation specifications. The Commission may find the non-commercial portion of the FM band a suitable test case for the usage of directional antennas before allowing their general usage in the Commercial FM band.

Comments to NTIA's petition for usage of directional FM antennas have shown a concern that although FM directionals are far easier to predict and maintain than AM directional antennas they can, nonetheless, be set askew by lightning damage. These commentors do not point out that most antennas that are significantly damaged by lightning will show a change in the voltage standing wave ratio (VSWR). In addition, modern techniques to prevent lightning strikes to broadcast towers have been developed and are elaborated on in the Engineering Handbook of the National Association of Broadcasters (NAB).[7]

IBS Comments authored by Ludwell Sibley in the April 1979 issue of **The Journal of College Radio** suggest that the Commission return to using the presently suspended terrain correction factor (Sec. 73.333). NTIA's FM petition, with the backing of NTIA's Institute for Telecommunications Sciences (ITS), goes much further along these lines to suggest the use of a computerized model for terrain correction. It is well known that a mountain range and/or rough terrain between two co-channel or adjacent channels will reduce interference. The exact effects are complex, but after more than a decade of study with many computer models, ITS has models that it feels are usable. The reasonable accuracy of these computer prediction methods has recently been born out by the comparison of ITS predictions to known field strength contour mappings in the MF band. However, more work is required.

While the question of using the computer for calculating terrain corrections or unusual directional patterns may require time to be solved, many computer techniques can immediately be put to use. Using the Commission's present protection standards a computer could be used to fit in new stations by doing the frequency search on a computer video terminal. Such usage is presently done by the National Weather Service.

A good example of the usage of this computer modeling was recently submitted by NTIA concerning low power TV stations (B.C. Docket 78-253). NTIA showed that by usage of directional antennas (and precise offset) a new low power VHF TV station could be added to Bakersfield, California without causing interference to TV station KABC in Los Angeles. With the addition of terrain effects, the model was reworked to get a higher power for the new Bakersfield station. Since the computer can compare signal coverage with demographic information, the directional characteristics of the antenna could be adjusted to cover the greatest population with a usable signal. It should also be noted, in passing, that the thrust of NTIA's low power TV filing was to create a low power TV service that could provide local programming to rural areas and specialized service to specialized urban populations.

As the FCC has a computerized FM data base, it is possible to pick a location inside the United States and receive a list of what stations are on what channels in that area. Furthermore, the computer can list the stations that would be short-spaced to this new location, including adjacent channel restrictions, and show by how many miles the station was short-spaced. Even without the adoption of directional antennas on terrain effects this computer could make the job of a frequency search much, much easier. A program, as described above, has already been developed by NTIA/ITS.

Once a determination has been made as to what the best available frequency in an area might be, coverage mappings can be drawn by using either the existent FCC methods or can later be changed when better methods are proven. This coverage mapping would then be compared to the mappings of already existent stations (kept in a master data bank) to see what contour overlap problems might need attention. In some cases, moving the location of the transmitter may solve the problem. (Again, there is a special computer program that can give the exact distance needed). If terrain and directional antennas are considered, it will become possible to custom-fit this new station. Terrain effects may show that, in a mountainous region, interference will not be a problem. Directional antennas may be of great use to put a null in the direction of a short-spaced station. At present the FCC does not permit directional antennas with nulls greater than 15 dB, however, further study should be done to find if 15 dB is truly the maximum.

In custom-fitting this new station to avoid objectionable interference to other stations, the area covered by the 3 mV contour may not cover the principle city of license. In the early days of FM radio, it may well have been important to see that a principle city of license was well covered. However, with the FM service considerably matured, it is perhaps time to drop this rule in favor of letting the broadcaster take his chances with a station that only partially covers the city of license. As mentioned earlier, the computer can also supply demographic information.

Assuming that for a minimal price, anyone with a video terminal could access the data and programs needed to find a location for a new station, the application to the FCC could be a combination of hard-copy printed material and a magnetic disc. The FCC would then plug in the disc and see immediately if the proposed station would meet technical standards. This would also decrease the amount of time spent processing an application.

In conjunction with computerized engineering, the ideas of standard directional antenna's, crude terrain factor, and multiple classes of stations could be implemented. Many considerations come into play in such an arrangement. For one, how do you follow the present protection standards? The present classes of stations allow an operation to open up at less than maximum power and/or antenna height at any time the station decides. Do you then take the standards with the assumption of everyone at maximum power? As the system was designed to provide high quality service with all stations operating at maximum parameters, taking protection standards in this situation should be proper from an engineering point of view.

However, the breakdown of the old system of classes will change the ability of a station to start at lower than maximum facilities. This is a matter for concern, but the solution is simple. Let's take a case of two co-channel stations that come on the air at low power in year X. Since both stations are low power their contours do not overlap (assuming no adjacent channel problems). If either station wishes to increase power significantly, the other station will not be able to do so. In this case, either station could simply apply and go up in power and the first one ready to do so should be given a go-ahead. If both stations apply for higher power at the same time, the FCC will call for a compromise whereby each can increase a small amount until their contours touch. At this point either station could increase power if it used a directional antenna and put a null toward the other co-channel station. Use of the directional antenna would also help the station that did not increase in power where the co-channel station already had. Although the co-channel station puts limitations on power increase in his direction, power increase in other directions might still be a possibility.

By this arrangement, the design of FM station location would be by contour, and in essence, an infinite number of station classifications. Although there is merit in the possibility of nine classes of stations as suggested by CPB and NTIA, the nine classes would make it tougher to adopt a computer-generated contour. In fact, when directional techniques are mixed with nine classes, the methods for determining classes and contours becomes uncertain. For example, if a class A2 station uses a directional antenna to add a small lobe, is it now a Class A2 with a lobe outside its usual contour, or is it really a Class A3 not fully filling an A3 contour? The nine classes of stations assume circular contours for administrative purposes. Although the idea of nine classes by itself might be an improvement over the present situation, when nine classes are mixed with directional antennas, a better answer is to use only the contour and not have finite classes of stations.

There is a problem in retrofitting such a system to the present situation. The contours of the existing stations must all be calculated and a grace period of perhaps three years must be given to existing stations in order for them to have a chance to upgrade as much as possible within their old classifications.

Classes of stations cannot be entirely thrown out in the commercial part of the band. At present we have low and high power channels. If this distinction is removed, it may become impossible for the Commission to balance the number of high powered stations against low powered. To remedy this, channels could retain maximum and minimum limits. This would keep the balance of high and low powered stations, however,

(Continued on Page 18)

cable radio:
one station's experience

By Ben Bencivenga
WPSC
William Paterson College

In 1980, there is no doubt about the fact that Cable FM and Cable Radio can be an inexpensive, effective and lucrative avenue for college and high school broadcasters — now more than ever. With the entire nation singing the Docket 20735 Blues, there are ways of expanding your audience and side-stepping those FCC bureaucratic hassles.

For the next few years, colleges, universities, high schools and the FCC will be stumbling all over each other attempting to establish some semblance of order while scrambling and scrounging to meet the new FCC rules and regulations. Given the track record of our illustrious (infamous?) communication regulatory agency, things may be confused despite some wise and sensible suggestions offered by IBS and knowledgeable individuals and institutions.

It must be noted that cable radio is virtually unregulated and the FCC has stated that they intend to keep their hands off cable radio because it poses no threat to on-air radio broadcasting. It is also the opinion of this writer that if cable radio ceases to be "relatively harmless" we might see the Washington bureaucrats show their teeth once again unless complete deregulation of the cable industry surfaces. In any event, now is the time to look into the pros and cons of cable radio. Hopefully, you and your institution will be pleasantly surprised.

Like most college stations WPSC, the student-owned and operated station of William Paterson College, had a modest beginning. In 1966, WPSC began "broadcasting" out of a closet in the music center with one turntable, one microphone and an amplifier connected to two speakers in the college snack bar. Founded by a dozen or so music and speech students and faculty, WPSC slowly grew and expanded as the college went through its state-mandated "identity crisis." For nearly a century, William Paterson College was a small teachers' school in Paterson, sixteen miles west of New York City. In 1956, the college moved to its present location in Wayne, two miles west of Paterson. In the late 1960's, new curriculum in theater and communications were added and this new emphasis increased student involvement and WPSC instituted several frequency searches for an FM facility to no avail. The New York Metropolitan airwaves were virtually saturated in our particular location. Although the college had several opportunities in the late 50's and early 60's to establish an FM station, the administration didn't foresee a need for such a facility. College officials in the late 1950's never thought that William Paterson would become the communications center for the New Jersey State College System in 1976 — but it did.

Between 1970 and 1975, the college enrollment increased from 5,000 to 12,000 and WPSC with a total staff of twenty in 1970 grew to nearly one hundred students in 1975. With new studios and equipment, WPSC began broadcasting with carrier-current transmitters while desperately searching for that elusive "Holy Grail" — an FM License. With the FCC freeze on applications until January 1, 1977, WPSC had already begun looking for ways to expand its audience since the open airwaves held no hope for the time being.

This leads us to 1975 when WPSC contacted the local cable television company requesting permission to tie into their newly created cable FM service. The problem was that the cable company surveyed its subscribers for the stations they wanted on the cable FM service. The system's limit was 24 channels and there was no way that a campus carrier-current station could compete with the omnipotent New York FM's — permission denied. In January of 1977, WPSC approached the new owners of the cable system, UA Columbia Cablevision, explaining our problem to them. They viewed WPSC as an ideal opportunity to increase community service. The entire cable system was ambitiously revamped with a dozen new computerized information channels but no audio background behind the computerized TV program guide, news and weather channel, horse race, sports, lottery channels and local shopping channel. Since WPSC was located in Wayne, the community with the greatest amount of subscribers for UA Columbia and our studios were only two hundred yards from the cable system's "head end," agreement was quickly reached to put WPSC audio behind the TV program guide channel.

Although this gave WPSC access to nearly 20,000 cabled homes, far more than cable FM would have reached, college officials and other student groups came down hard on our new "hook up." WPSC felt compelled to use a comprehensive contractual agreement covering line costs, channel availability, a termination clause and mutual liability for circumstances within and beyond our control. We were immediately investigated by the state for entering into agreement with a profit-making corporation. Accusations true and false, flew for a few weeks until the state and college gave its blessing to our contract. If your station is considering such a move, checking with the college or university administration beforehand is advisable as is the use of a contract to protect everyone's interests.

Your programming philosophy may also encompass the attitude that "what serves the campus, serves the cable" in that order because such a move may come under close college scrutiny and it is bad publicity if your station is accused of abandoning the campus interests for outside recognition.

Cablecasting has many advantages over FM and carrier-current broadcasting. The main plus is that cable radio is unregulated. What you pump out is your business and if it's good programming, that's all the better. If it's unlistenable, or self-centered, it **will** be reflected in listenership and in

the attitude of the cable company. Records of public service programming, listener requests, commercial (yes, commercial) spots, PSA's and hours of operation help tremendously when it comes time to renew a contract. Cooperation with the cable company is also a must. Maintain a good rapport and close working relationship with the people that are **allowing** you to use their system because they can easily **charge** you channel time if things get sticky, although this should be covered by the contract. If your station chooses the background audio route instead of cable FM, try to come to an agreement to have your signal placed behind a popular information channel and one that isn't interrupted by local origination, public access or government programming.

Technically, insure that your studio equipment works and works well. You should remember that your signal is heard through a cheap four-inch TV speaker and if it sounds lousy in the studio, imagine what it is like in somebody's living room. The broadcast line is also a problem. WPSC first used an unbalanced line because of our close proximity to the head end. It turned out that our signal sounded like it was coming over a telephone. The phone company usually offers three types of balanced lines, an 8 KHz, a 12 KHz or a 15 KHz line. If your studios are close to the head end, an 8 or 12 KHz line might be fine. If you're located a great distance from the cable system, a 15 KHz line might be needed. It must be noted that balanced lines are expensive and are charged by the mile. WPSC is fortunate being so close because we now use a 12 KHz line with an unbalanced backup line.

If Cable FM is your bag, some systems won't accept a mono signal. This means that your studio may have to be converted to stereo. This requires expensive equipment and not one, but two balanced lines for your hook-up and normally the cable company will assume no financial obligation for the hookup. If your station has adequate funding for such a venture . . . GREAT!!! If not, it takes money to maintain the equipment, service and broadcast lines. This is when the ability to sell commercial time can be a lifesaver. WPSC has had tremendous success selling spots to local and national advertisers. Reasonable rates, good production and living up to your advertising commitments can bring repeat business, greatly increase programming opportunities and most importantly . . . provide a way to pay the bills.

All this good stuff should have one major effect on your station operation and staffers: It's the feeling that people **are** listening to you, the realization that you aren't just spinning records or wasting time talking to yourself and that your station has the opportunity to be recognized by many people who choose to listen to you instead of just the captive audience in the snack bar, pub or campus dorms. Many have asked the question, "Who would turn on the television to listen to a radio station?" WPSC's answer is "thousands of people every day." Our request call log sometimes tops 400 calls daily. Our little campus carrier-current station now has a potential audience of 250,000 people in 50,000 cabled homes. It is something that WPSC staffers don't take lightly. Cable has motivated us to strive for professionalism with the realization that cable is a booming industry and that our audience is expanding every day as the cable system grows.

Cable-casting is no cure-all for station apathy, but it helps. WPSC has learned through its mistakes to use cable for the benefit of everyone. We like it and evidently, so do our listeners. If you have any questions that we might be able to answer, drop us a line at WPSC, 300 Pompton Road, Wayne, New Jersey 07470 or call (201) 595-5902.

coppertone sponsors public service campaign

Coppertone Sun Care Products, a division of the Shering-Plough Corporation, is co-sponsoring a series of local clean-up events coordinated through college radio stations across the country. The program, called the "Coppertone/Clean Up Your Act" campaign, will be tested on 100 college campuses this Spring.

At each campus, the college radio station will coordinate participation of up to 5 campus groups, clubs, or organizations, who will volunteer to clean-up a specific area of a local park, beach, or other recreational area. Each group will submit notes and photos describing its work, and the college radio stations will judge first, second, and third place winners on each campus. Local group winners will be awarded plaques and individual sport bags containing T-shirts, beach towels, etc. Everyone participating will receive T-shirts, litter bags, and Coppertone product samples.

Each participating college radio station will forward the notebooks and photos from its local groups for the selection of a national winner. The winning group nationally will receive a $5,000 scholarship. And, there'll be a random drawing from the names of all participating students nationwide to award a total of 40 individual Garelli mopeds.

Though participating selection has been virtually completed, there may be a few last-minute openings. If your station is interested, contact the IBS office immediately at (914) 565-6710 for more details or see the Coppertone representative at the IBS National Convention.

building your own control board . . .

(Continued from Page 8)

toylike. Really large knobs on a dramatically wide board will make your project look very impressive.

Large knobs are not commonly available from the usual electronics supply houses. The knobs used on some commercial control boards such as Harris (Gates) are available as replacement parts from the manufacturer. The knobs shown on the control board in the photographs are 2-1/8 inches in diameter and feature an attractive chrome insert and two set screws. These were purchased for $1.32 plus shipping from National Radio Corporation, 89 Washington, Melrose, Massachusetts. They are available in either black or gray, and are known as "HRT" knobs.

Stereo Mixing Pots

If you're building a stereo board, you will need "ganged" pots, two pots on a single shaft. Inexpensive carbon dual pots suffer from poor "tracking." That is, resistances do not change exactly the same from section to section. The result is changing balance in the stereo sound as the pot is turned up and down.

To avoid this problem with inexpensive dual pots, follow the suggestion about wiring a fixed resistor from wiper to ground. The exact value of the resistor is not important, but use an ohmmeter to choose two resistors which match as closely as possible, and wire these from wipers to ground on a dual pot. Matched resistors of 20 per cent or less of the resistance of the pot sections will tend to "swamp out" variations in the pot "tracking" and greatly improve the balance. This works best with linear-taper pots. Perhaps you can locate dual Ohmite "AB" brand pots (which come only in linear taper) of suitable resistance. Just be sure the resistance of each section is the same.

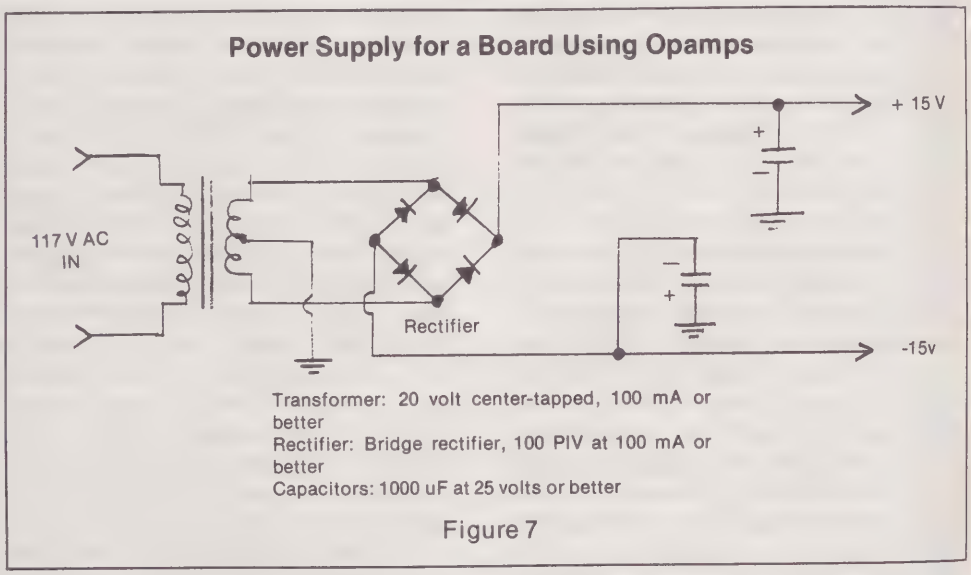

Figure 7

The Power Supply

A simple control board deserves a simple power supply. I have found for non-critical use that opamps such as the LM301 do **not** require a regulated supply. They do require the usual dual or split supply, but a single transformer, bridge rectifier, and two **large** filter capacitors are adequate. See Figure 7. It may be necessary to wire capacitors of about 0.1 uF value directly from the + and — inputs of each amplifier to ground to avoid oscillation, but this is a characteristic of the opamp rather than a fault of the power supply.

Opamps are generally rated at plus or minus 18 volts maximum. A power transformer rated at 24 volts or more center-tapped is too high. Though harder to locate, try to use a transformer rated at 20 volts center-tapped.

The power supply diagram for a control board using the suggested LM386 amplifier includes a 3-terminal 12-volt voltage regulator. (Figure 8). Such regulators are cheap and easy to use, and the power supply remains simple. Furthermore, the single-ended 386 is more sensitive to power-supply hum than opamps and require better filtering.

Be sure to include a fuse of suitable current rating in the primary of the power transformer. In the unlikely event of a failure, you don't want to blow the circuit breaker for the whole Student Center.

Normally, I wire all components of the power supply inside the control board's case, except for the power transformer. Mounting it externally avoids possible magnetic hum problems, and it also keeps the 117 volts A.C. completely out of the board itself. However, with care it is possible to mount the transformer internally and fabricate a fully self-contained control board.

I do not use a power switch. It's another control for disc jockeys to forget to operate. The integrated circuits use very little power when idling. An old tube-type board which draws upwards of 200 watts continuously when on is a different matter, but a small modern IC board certainly requires no power switch of its own.

Two standard jacks are mounted below the VU meter. The "output" jack feeds earphones, and the "input" jack allows direct access to the mixing buss for patching in a portable cassette recorder for playback. Removing the top exposes components and wiring for maintenance and service.

Phono Preamplifiers

Traditionally, the turntable preamplifier has been external from the control board and mounted near the turntable itself. While I have built solid-state preamps with proper equalization inside control boards, it is difficult to beat the price and convenience of the plug-in-to-the-wall phono preamps sold by dealers such as Radio Shack and Lafayette. These units are very inexpensive and while they may not have equalization as precise or noise level as low as a commercial broadcast-quality preamp, remember that we're doing this all on a tiny budget.

Remember, too, that broadcast-quality preamps usually come with expensive output transformers and sufficient power to feed into a 600-ohm (or even 150-ohm) load, traditional for old-time control boards. On our board, the preamp feeds into the much lighter load of the 10,000 ohm pot.

Note that these consumer-grade preamps are stereo units, and the separation between channels may not be sufficient for two different turntables in a mono control room. However, they are still inexpensive if only one channel is used.

The Case

The small 5-pot production board shown in the photographs was built inside a standard aluminum chassis, 17" x 13" x 3" high, with the top open rather than the bottom. This results in a low control board with great accessibility. Just lift off the top and all of the wiring is exposed.

For the front panel I used 1/8" thick aluminum in the form of a standard 19" wide relay rack panel. Both the rack panel and the large chassis are available from the large electronics parts houses. Be sure to get aluminum, not steel. The heavy front panel gives a solid look and feel to the project.

I cut pieces of wood to fit the ends of the chassis, stained them, and secured them with wood screws driven from inside the case. A sheet of wood cut to fit the top finishes the control board, while retaining the accessibility. The combination of wooden case and aluminum front panel results in a control board as attractive as it is functional. If you need a control board wider than 17 inches, mount two chassis side by side. A long low control board, three feet wide but only inches high, can be very impressive in appearance.

Or you can have a suitable case made to order. Virtually any community has sheet metal shops. While they specialize in ductwork for heating and air conditioning, most will have the necessary shearing machine and sheet metal bending brake to fabricate a case for you. Draw the case indicating the dimensions, and incorporate a sloping front panel if you like. I suggest keeping it only a few inches high but wide enough for all your pots and a VU meter.

Sheet metal workers customarily work with galvanized iron. You may have to wait while a shop obtains sheet aluminum. While you're at it, ask the shop to get a piece of 1/8" thick aluminum for the front panel, cut to exact size. Get a quote first.

You'll need an electric drill to prepare front panel holes for the pots (use a 3/8" drill bit) and to prepare the rear panel for the necessary external connections . . . jacks, barrier strips, etc. You'll need a large round hole to mount most VU meters. I mark the hole, drill a series of small holes inside the mark, and finish with a coarse half-round file. It's slow, but cheap.

The Monitor Amplifier

I always use a monitor amplifier separate from the control board itself. To feed the control room speakers, any amplifier of reasonable quality and a few watts output should be satisfactory. If you need to feed speakers in other studios, office, etc., use a separate amplifier. The monitor amplifier for the control room should be dedicated to that purpose, as its level and muting are controlled within the control board. Place this amplifier in an inaccessible location, setting its volume control for a reasonable range on the control board's monitor level control.

Warning Lights

The microphone switch should provide contacts to control a warning light. Do **not** wire 110 volts a.c. directly to this switch! If it controls a relay, use d.c. for the relay, and don't ground the relay power supply to the board or you will have clicks in your audio. I have used a flashing LED mounted at eye level as a warning light, and found that it attracted more attention than a 100 watt red bulb burning steadily **over** a door.

Headphones

I use a separate 386 integrated circuit amplifier to drive headphones. An opamp amplifier may also be used. This makes it easy to provide a level control for headphones, wiring it at the input to the headphone amplifier.

The output of the headphone amplifier is wired in parallel to both sides of a three-way jack. Thus, standard low-impedance stereo headphones may be plugged in without alteration. Operators may bring their own headphones. In fact, to avoid the problem of excessive wear and pilferage, my station now no longer provides headphones, but allows operators to use their own. This has reduced strain on the budget.

The 386 IC makes a fine headphone amplifier used by itself, for any location in your station where you need to feed low impedance headphones. Just build one 386 circuit and provide a level control and a power supply. For power, obtain one of those transistor radio or cassette recorder "battery eliminator" power supplies, add at least 1000 uf of additional filtering capacitance across the output, and you're all set. 6 volts is adequate, or you can use 9 or 12 volt units.

Keep It Simple

Fabricating your own control board is a big project, but it can be handled if you keep it simple. Don't get carried away and make it as complicated as possible, which may delight technical people but will confuse inexperienced non-technical announcers. Build the facilities you need, and no more. You don't need to allow extra controls "for the future." The future is nearly always different from expected, but a home-fabricated control board is inexpensive enough to warrant a new control board in a few years. Conversely, a commercial control board may also become outdated in this era of high technology, but its thousands of dollars of capital investment make it difficult to replace.

By all means, build a single-output board . . . at least for your first board. The possibilities of crosstalk in a board designed to handle two different programs simultaneously are astronomical. You will have bugs, no matter how carefully you plan, so keep it simple and allow plenty of time. And if you have specific questions, please write to me: Mr. Ronald Pesha, Adirondack Community College, Glens Falls, NY 12801.

Power Supply for a Board Using LM386 Amplifiers

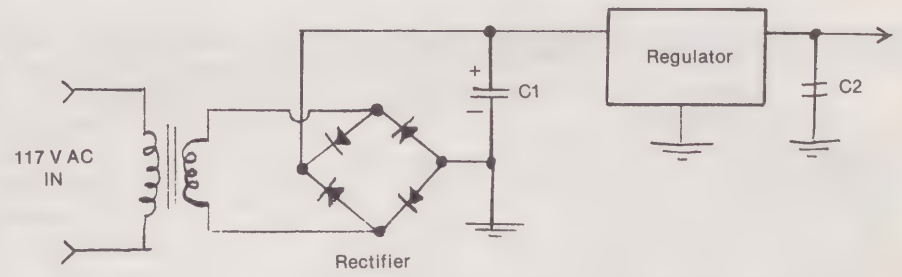

Figure 8

Transformer: 12.6-volt, 100 mA or better
Rectifier: Bridge rectifier, 100 PIV at 100 mA or better
Regulator: 12-volt three-terminal regulator, 100 mA or better (usually available in 1-Amp size)
C1: 500 uF at 25 volts or better
C2: 0.1 uF

more on alternatives to an ED-FM table of assignments . . .

(Continued from Page 13)

having only stations of Class C or B type on one channel can leave holes where Class A type stations might be inserted. Ad hoc exceptions could be made for Class A stations on saturated Class C channels. The relevance to non-commercial interests is whether or not these drop-ins could be assigned to non-commercial stations.

As a separate matter, CPB has recommended co-located 3rd adjacent channel allocations. There may be potential here, although NPR has reported one case in the field that is having some trouble. In addition, NTIA/ITS has found that Los Angeles and other major cities have cases of non-colocated 2nd adjacent channel allocations that appear to work out without complaints by the listeners. Further study of 2nd and 3rd adjacent allocation is very desirable as would also be a complete study of FM receivers in the under $100 range (published tests exist for many receivers that cost over $100). It is hoped that the FCC and/or NTIA will conduct such a study next year.

Last April, NTIA submitted a petition to the FCC concerning the possibility of reducing the channel spacing in FM radio to 150 or 100 kHz as is done in some parts of Europe. NTIA has received strong negative comment on this plan from the Institute for High Fidelity and verbally, from broadcasters during a panel meeting at the NRBA convention. The strong concerns are to see that SCA operation is not curtailed and that no loss to fidelity of the service is incurred. Other parties can be expected to object as narrower spacing could preclude certain surround-sound quadraphonic systems (particularly 4-4-4 systems). Caution must be taken in the area of reduced channel spacing and it must be shown that the quality of service is not sacrificed even at 180 kHz spacing. Another problem is that such a study will take time, and as time goes by, more and more digitally-tuned receivers, not capable of anything other than 200 kHz spacings, go into use.

CONCLUSION

Recent actions at the FCC to change the rules for Class D stations have resulted in many Class D stations becoming Class A stations. These changes have made the spectrum situation far more difficult for high powered stations wishing to come on the air in the top 100 markets. If EDFM goes to a table of allocations, rather than a flexible computerized contour approach, it will be an inefficient usage of EDFM spectrum. Indeed CPB may find college stations filling up the allocations table to the exclusion of NPR stations wherein the contour system may see all parties getting more stations.

Cooperation is the key. Had cooperation been present earlier it might have been easy to move all of the Class D stations to the low end of the EDFM band (channels 200 through 203). In this fashion the Class Ds could have been packed very tightly, they would not preclude high power stations, and the Channel 6 interference problem could have been partly eliminated. The time for such a change is passed, but there is hope that opportunities such as this will not be missed in the future.

FOOTNOTES

1. Close, Jeffrey, **Political Forces Behind the Slow Advancement of FM Radio**, pp. 16 and following.
2. It is unfortunate that no formal study has been done to find out what percentage of the people in the broadcasting trade have participated in college radio.
3. "A Public Trust," The Report of the Carnegie Commission on the Future of Public Broadcasting. Bantam Books, Inc., New York, 1979, p. 188.
4. Further Notice of Proposed Rulemaking of the FCC in Docket 20735, released 19 June 1978, paragraph 3.
5. Petition of the National Telecommunications and Information Administration of April 1979 concerning FM radio.
6. Petition of the National Telecommunications and Information Administration of April 1979 concerning FM radio, p. 17.
7. See pp. 991-996, 1979 Edition.

fire hits IBS office

A quick-spreading fire which started in an adjoining basement has caused serious physical damages to the building in which the IBS offices have been located at Vails Gate, New York. The fire, which occurred the evening of February 5th, necessitated relocation of the IBS headquarters to temporary facilities, but the IBS telephone number, (914) 565-6710, and the mailing address, P.O. Box 592, Vails Gate, NY 12584, both remain the same.

The office relocation will not affect the upcoming IBS National Convention, March 21-23 in New York City. Rick Askoff, former Executive Director of IBS, has rejoined the staff on a full-time basis to devote his attention exclusively towards the convention's planning.

IBS member-stations with pending equipment/supplies orders should contact the IBS offices concerning any revised status of these orders and shipping dates. Shipments of the IBS Master Handbook will also be affected, but a major revision and update is scheduled for publication over the Summer.

IBS NATIONAL CONVENTION

for school and college radio broadcasters

Friday - Saturday - Sunday

March 21-22-23, 1980

Sheraton Centre Hotel

7th Avenue at 52nd Street

New York City

The largest annual convention for college radio returns to the "Big Apple" (New York City) for a weekend packed with practical sessions covering almost every aspect of station operations, including programming, news, engineering, administrative management, sports, FCC, record service, and a lot more.

NOW is the time to register, make your hotel room reservations and travel plans.

For details and registration info, see your Station Manager or call:

IBS National Convention
Box 592
Vails Gate, NY 12584
(914) 565-6710

FCC proposes public expense reimbursement in rule makings

The FCC has proposed a one-year pilot program of reimbursement to individual consumers, groups and small businesses for expenses incurred in their participation in FCC rulemakings if funding for such a program is provided by Congress.

The Commission concluded that the high cost of effective participation in its proceedings limited and often prohibited contribution of information and opinions by the public. It found that an increase in public participation would assist the FCC in reaching sound decisions in the public interest.

It emphasized that reimbursement of expenses to encourage participation would be for the FCC's benefit in making its decisions, not for the benefit of any individual or group.

Reimbursable participation would include presenting evidence to the Commission and staff, the costs of research and analysis, fees for legal representation, experts and consultants, travel to Washington, D.C., or elsewhere, as necessary, and similar expenses.

The program would be for one year, if Congress approved funding. The actual amount sought for reimbursement would be $500,000.

The Commission's action was in the form of a Notice of Proposed Rulemaking. It asked for comments from interested persons and organizations by April 7, 1980 and reply comments by May 23, 1980. Final action will come after analysis of the comments received.

The program would not create any new or additional right to participate in FCC proceedings.

As the Commission envisaged the procedure, individuals and groups would file their applications on any rulemaking, preferably early in a proceeding, outlining their proposed lines of inquiry and estimating their expenses. Late applications would be considered, and requests for supplemental reimbursements would be in order if certain conditions were met. The Commission itself could invite applications and set deadlines, and it could deny all reimbursement applications in a proceeding.

records missing?

If albums, letters or other packages for your station are being stolen before they reach your college, try working with the local government Post Office to stop the theft or loss.

Be certain that the packages are being delivered. If they are being delivered, but stolen at the school post office, you have to work with the college. Once a package is delivered, the federal Post Office is no longer responsible.

Get a Form 1510 from the local Postmaster, discuss the problem with him, ask him to pay attention to packages addressed to your station.

Get the extra information that you need to complete the 1510 from your record company representative or salesman or whomever. Make sure you know that you are having this problem. Fill out the 1510 as accurately and completely as possible. Try to include any mailing labels from past packages if possible.

After you turn the 1510 in to the Postmaster, the Post Office starts working. One copy is kept in a file in your local Post Office (the 1510 is one page of information for you to fill out, but it is automatically triplicated). If the Post Office file has frequent enough additions, or is very large, the regional office puts its house detectives on the case. Here is one time when it pays to be a chronic complainer.

If a package that was missing turns up, tell the Post Office and bring the Postmaster the envelope or package wrapper. They can tell where the package has been and how it was delayed. This can be important information.

Talk with your Postmaster, talk with other Music Directors and Program Directors in the area; any information and team effort will help.

IBS

jcr free classifieds

We are looking to buy one or two used carrier-current transmitters with couplers, 5-watts or 20-watts. WDRQ, Box 102, University of Pittsburgh/Bradford, PA 16701 or call Clive Chittick, (814) 368-9394.

* * * * *

Have you registered yet for the IBS National Convention? The dates are March 21-22-23, 1980, at the Sheraton Centre in New York City. For last-minute information, call IBS at (914) 565-6710.

* * * * *

Do you publish a Program Guide? Be sure to put us on your mailing list. IBS, Box 592, Vails Gate, NY 12584.

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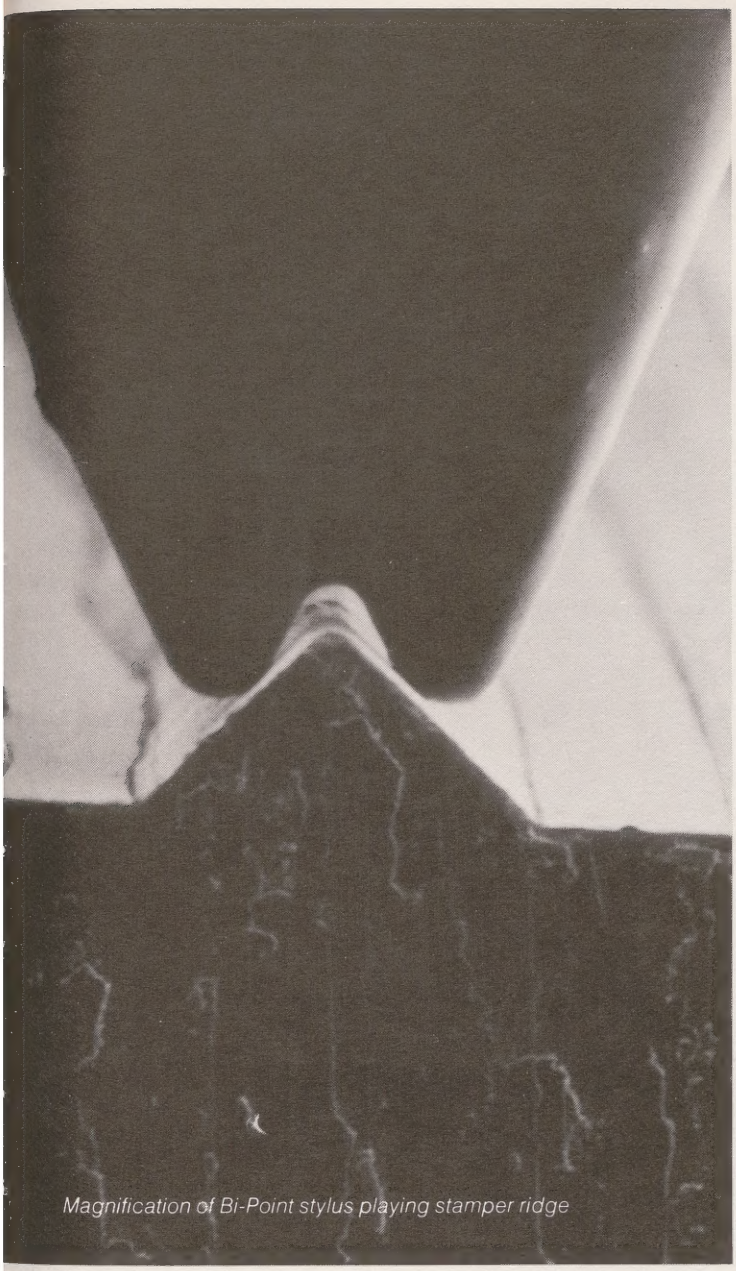
JCR Free Classifieds are a no-cost way to look for good buys on used equipment that your station needs, and to convert equipment you no longer need into cash to supplement your budget. Send your briefly-written ads to: JCR Free Classified, IBS, Box 592, Vails Gate, NY 12584. If we don't receive them in time for the next issue of JCR, we'll try to publish them in an upcoming IBS President's Newsletter.



Magnification of Bi-Point stylus playing stamper ridge

BPS operates in reverse

Stanton-The Professional in The Recording Industry

Application – Stanton plays back the stamper

One step in the process of delivering recorded sound to you is the production of nickel plated stampers, which are negatives from which positive image vinyl phonograph records are pressed. The stamper has a ridge instead of a groove and until two years ago there was no way to playback or evaluate stampers. At that time Stanton designed and manufactured the world's first and only stylus and reverse turntable system capable of playing back stampers.

The Stanton 681 BPS (Bi-Point Stylus) has two points which fit over the ridge enabling the stamper to be played back and evaluated. Thus, Stanton offers the recording industry a tool which saves precious time, provides a revolutionary way to evaluate the quality of the manufacturing process and assures the quality of the record.

The 681 BPS cartridge is exclusive with Stanton and has opened up a whole new area of exploration for archivists and collectors worldwide who are in possession of rare and very old stampers of recordings from past eras. Stanton's 681 BPS cartridge makes possible the transcription of these antique stampers to new vinyl where modern methods can extract the original sound producing a recording as close to the original as possible. *From disc cutting to disco to home entertainment your choice should be the choice of the Professionals... Stanton cartridges.*

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